COMPACT MOTOR POWER SENSOR MODEL TP-2
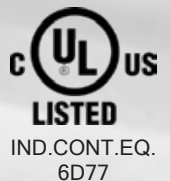
INDUSTRIAL APPLICATIONS:

- Pump Protection and Control

- Mixer Monitoring

- Process Feedback

c(UL)us
LISTED
IND.CONT.EQ.
6D77

MODEL TP-2

COMPACT
- 3" x 3.9" x 1.75" High
  (77mm x 100mm x 45mm)
- Fits in Size 1 "Buckets"
- Mounts in any direction
- DIN RAIL ADAPTOR AVAILABLE

HOOK TO
- Meters
- Data Collection Systems, MES, SCADA
- Programmable Controllers
- Recorders

4-20 MILLIAMP ANALOG OUTPUT
- Proportional to Motor Power
- Loop Powered

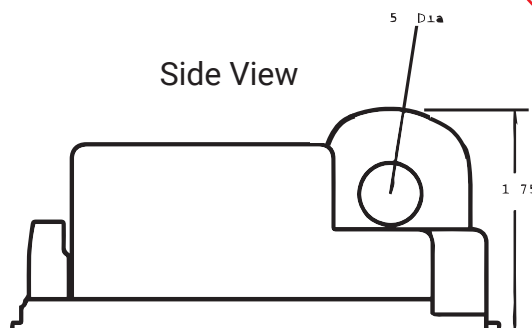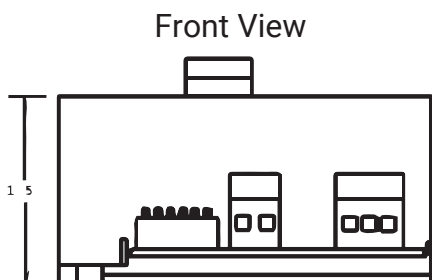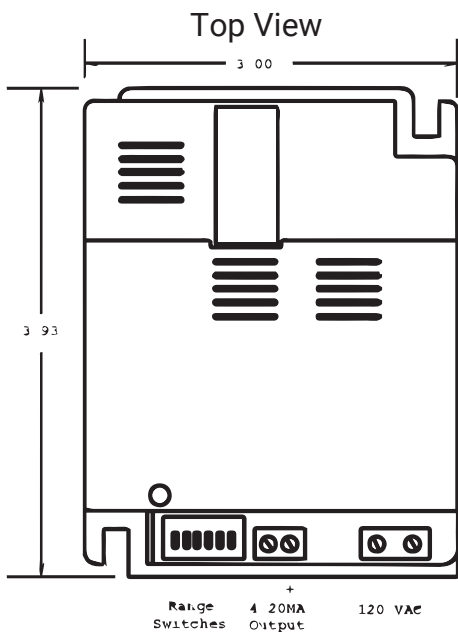## SIZE FOR BOTH SMALL AND LARGE MOTORS
For smaller motors
- Take more passes or turns through the window.
Example: Passing the wire through twice reduces
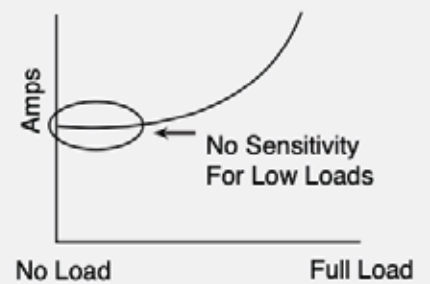.5HP to .25HP
For larger motors
- Use with Current Transformer
- Or use UPC, Universal Power Cell

DIMENSIONS

- 3" x 3.9" x 1.75" high
  (77mm x 100mm x 45mm)

- Window .5" (13mm)

Top View

Range Switches   4 20MA Output   120 VAC

WHY MONITOR POWER INSTEAD OF JUST AMPS?

Power is Linear Equal Sensitivity at Both Low and High Loads

No Load — Full Load

No Sensitivity For Low Loads

No Load — Full Load

Front View

Side View

.5 Dia
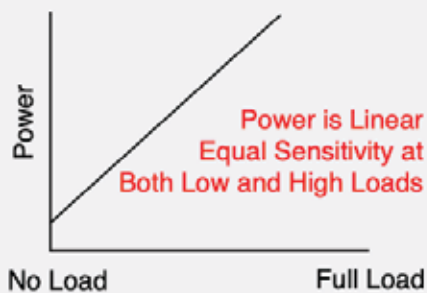
Also Available: TP-2 Single Phase

TYPICAL INSTALLATION - MODEL TP-2

The TP-2 senses the electical power input to a motor (horsepower). The Output is a 4-20 Milliamp LOOP POWERED analog signal proportional to power.

VOLTAGE

120 Volts AC are taken from two of the phases. If the motor starter already has a 120 Volt control transformer, it can be used. Otherwise, install a separate transformer. It is OK if the secondary is grounded. BE SURE TO NOTE WHICH TWO PHASES SUPPLY THE TRANSFORMER.

In a 120/208V three phase system, the 120V MUST come from a transformer connected to two of the phases. The 120V phase to ground voltage cannot be used.

CURRENT

The current signal is taken from the REMAINING phase. Pass this wire directly through the window in the TP-2.

It is VERY IMPORTANT that the current signal comes from the phase that IS NOT supplying the 120 Volt control transformer. Be extra careful when the machine has reversing starters or multi-speed windings. If a wrong phase is used the control will either:
• Work backwards
• Have reduced sensitivity

ANALOG OUTPUT

4-20MA Loop Powered.
Max. Loop voltage 28 VDC

4-20MA
LOOP POWERED
24 VDC

120 VAC FROM 2 PHASES

CURRENT FROM
REMAINING PHASE
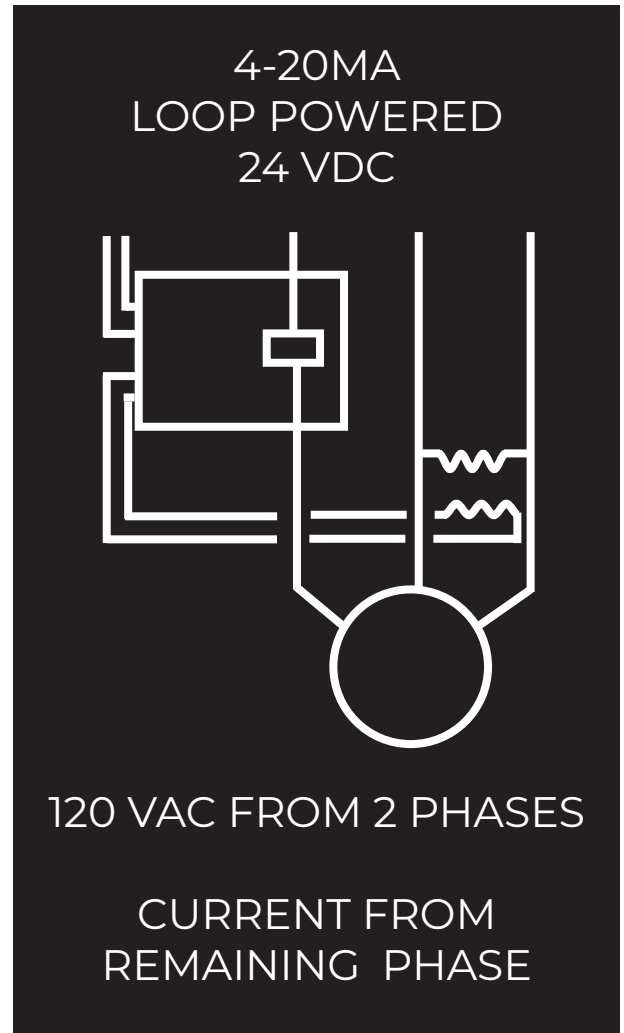
1 & 2 = 25 HP
1 & 3 = 20 HP

24 VDC

15 HP	10 HP	5 HP	3 HP	1 HP	.5 HP	−	4-20MA	+		120 VAC	
1	2	3	4	5	6						
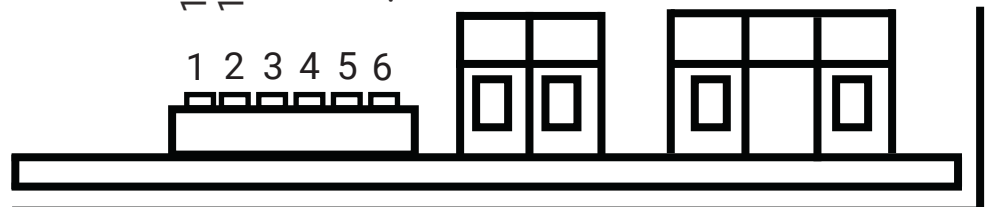
SPECIFICATIONS

ACCURACY
• 2%

RESPONSE TIME
• 500 MS

TEMPERATURE
• 0-50° C

CAPACITY

Select the capacity by turning one (or two) of the Dip Switches on:

Full Scale HP
460 Volt (nominal) Primary

Switch	HP
1 & 2	25 HP
1 & 3	20 HP
1	15 HP
2	10 HP
3	5 HP
4	3 HP
5	1 HP
6	.5 HP

Multipliers

For Nominal Voltages Other than 460 Volts

Multiply 460V full scale by:

208V = .45
230V = .5
380V = .83
415V = .9
575V = 1.25

Example: A 20 HP 230V motor should be scaled for 10 HP (20 x .5)

# LARGER MOTORS: USING THE TP-2 WITH CURRENT TRANSFORMER

- Set Dip Switch for 3HP
- CT 5 Amp Secondary through hole
- Full Scale HP = (Primary Volts) (CT Primary) (0.0016)
  Example: 460 Volts Primary, 100:5 Current Transformer
  Full Scale HP = (460) (100) (0.0016) = 73.6HP
  KW=HP x .746

Full Scale HP at 460 Volts with Current Transformer

50:5	36.8 HP	200:5	147 HP
70:5	55.2 HP	300:5	221 HP
100:5	73.6 HP	400:5	294 HP
150:5	110 HP	500:5	368 HP

REMEMBER: Put the CT on the phase that is not supplying the 120 Volt transformer.

TP-2 Wiring Diagram with External CT
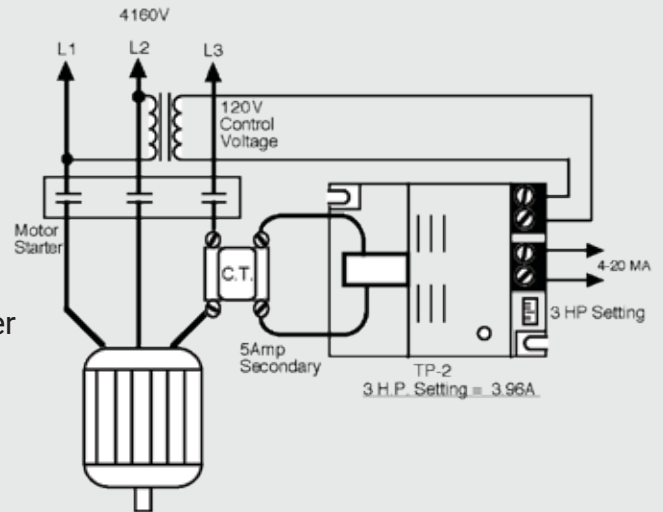
Full Scale Electrical Power is calculated:
Motor Voltage x C.T. Primary Rating x 1.732 (Sq. Rt. 3) x $\frac{3.96}{5}$

Example:
Motor Voltage = 4160V   CT Primary 100A
Full Scale = 4160 x 100 x 1.732 x 3.96/5 = 571 KW = 765 H.P.
Electrical Power
Output Power or Mechanical Power is calculated
Electrical Power (Either KW or HP) x Motor Efficiency